Medical Science

To study the incidence of lung cancer in patients of newly and previously diagnosed Chronic Obstructive Pulmonary Disease at AVBRH

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General Note

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ABSTRACT

Context: Chronic obstructive pulmonary disease (COPD) patients are at increased risk, for the development of primary lung cancer due to cigarette smoking as the common etiological factor. *Material and Methods*: This study was an observational cross-sectional study conducted in Department of Pulmonary Medicine, AVBRH, Sawangi. Here we studied 100 newly and previously diagnosed patients of chronic obstructive pulmonary disease by spirometry and compare the incidence of lung cancer in these patients. *Results:* Out of 100 patients of newly and previously diagnosed COPD, 9 patients have lung cancer. In this 9 patients of lung cancer 6

(66.66%) were already diagnosed COPD and 3 (33.33%) were newly diagnosed COPD. Most of them 8 (88.89%) patients of lung cancer were smokers. Squamous cell carcinoma were the most common histological type found in 6(66.66%) patients followed by Adenocarcinoma in 2 (22.22%)patients and only 1 patient has Small cell carcinoma. *Conclusion:* There is increased risk of development of lung cancer in previously diagnosed COPD patients than newly diagnosed COPD patients with smoking is the common factor.

Keywords: Chronic obstructive pulmonary disease, lung cancer, spirometry

1. INTRODUCTION

Chronic obstructive pulmonary disease (COPD) patients are at increased risk, for the development of primary lung cancer due to cigarette smoking as the common etiological factor. The prevalence of COPD in lung cancer patients varies from 8% to 50% and the annual incidence of lung cancer arising from COPD has been reported to be 0.8% to 1.2%. The probability of developing lung cancer within 10 years in patients with normal pulmonary function is 2.0% while it is 8.8% for those with COPD. This shows that 1% of patients with COPD develop lung cancer each year while only 0.2% of patients with normal pulmonary function develop lung cancer (Sekine et al., 2012). The influence of Lung cancer on COPD and vice versa is more harmful and the earliest detection of lung cancer in COPD is mandatory. With this in view, the present study was being conducted to determine the incidence and clinical profile of lung cancer in COPD patients at Acharya Vinoba Bhave Rural Hospital.

Aim

To study the pattern and clinical profile of lung cancer in patients of Chronic Obstructive Pulmonary Disease

Objectives

To determine the incidence rate of Lung cancer in patients of Chronic Obstructive Pulmonary Disease
To study the incidence of lung cancer in previously and newly diagnosed COPD patients.

2. MATERIAL AND METHODS

This study was initiated after obtaining clearance from the institutional ethics committee, DMIMS (DU), Sawangi (Meghe), Wardha. The cross-sectional and observational study was conducted at Acharya Vinoba Bhave Rural Hospital, Sawangi (Meghe) in indoor patients. 100 COPD patients admitted to AVBRH comprise material for study. The study was conducted from August 2017 to July 2019. The main purpose of this study was to understand the incidence and clinical profile of lung cancer in newly and previously diagnosed COPD patients.

Inclusion criteria

Patients of both genders above the age of 40
Previously and newly diagnosed cases of COPD and Stage according to GOLD guideline by spirometry
Patients willing to participate in the study after giving informed consent

Exclusion criteria

Previously diagnosed cases of chronic lung diseases other than COPD
Patients unable to perform spirometry
The diagnosis of COPD by:
1. History suggestive of COPD
2. Clinical presentation
3. Post bronchodilator spirometry
4. Radiological findings on X-ray chest and HRCT/CECT (whenever indicated)
5. Other investigations like 12 lead ECG, arterial blood gas analysis, hemoglobin, white blood cell count, sputum examination for AFB, pyogenic culture & cytology for malignant cells and bronchoscopy (whenever required), FNAC/Biopsy from mass lesion for diagnosis of malignancy.

3. RESULTS

Out of 100 previously and newly diagnosed cases of COPD by spirometry, 9 patients were diagnosed to have lung cancer. These lung cancer patients were distributed as follows.

Table 1 Distribution of Lung cancer patients in already diagnosed and newly diagnosed COPD patients

History of COPD	No of Lung Cancer Patients	Percentage (n = 9)
Already diagnosed	6	66.66
Newly diagnosed	3	33.33
Total	9	100

Above table 1 and graph 1 shows the distribution of lung cancer patients according to already and newly diagnosed COPD. 6 (66.66%) lung cancer patients were already diagnosed cases of COPD, while 3 (33.33%) were newly detected of COPD.
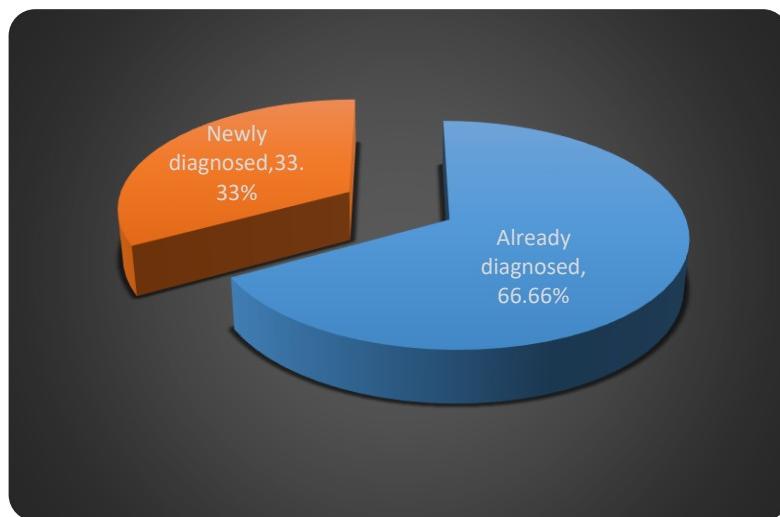
Graph 1 Distribution of Lung cancer patients in already diagnosed and newly diagnosed COPD patients

Table 2 Distribution of Lung Cancer patients according to History of Smoking

History of Smoking	No of Lung Cancer Patients	Percentage (n = 9)
Present	8	88.89
Absent	1	11.11
Total	9	100

Above table 2 and graph 2 shows the distribution of lung cancer patients according to a history of smoking. 8 (88.89%) lung cancer patients were found to have a history of smoking and all were males while 1 (11.11%) patient was a non-smoker.

Table 3 Distribution of Lung Cancer patients according to Histopathological /Cytopathological Type

Type of Lung Cancer	No of patients	Percentage (n = 9)
Adenocarcinoma	2	22.22
Squamous cell carcinoma	6	66.66
Small cell carcinoma	1	11.11
Total	9	100
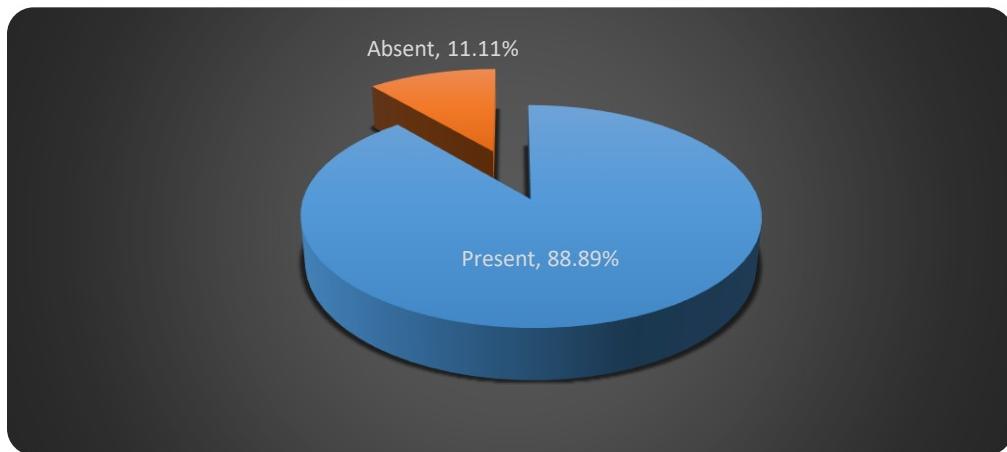
Graph 2 Distribution of Lung Cancer patients according to History of Smoking

The above table 3 and graph 3 shows the distribution of Lung Cancer patients according to histo/cytopathological type, in which 2 (22.22%) out of 9 found to had adenocarcinoma, 6 (66.66%) had squamous cell carcinoma which was the most common type found and only 1 (11.11%) patient had small cell carcinoma.
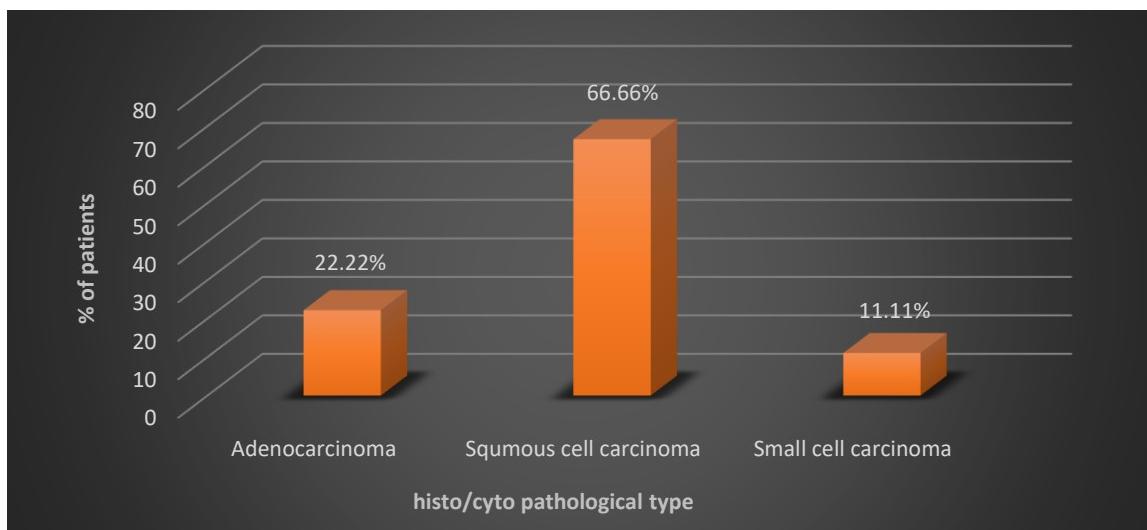
Graph 3 Distribution of Lung Cancer patients according to Histopathological /Cytopathological Type

4. DISCUSSION

The diagnosis of COPD was based on history, clinical presentation, radiological findings on X-ray chest and HRCT (as indicated) and post-bronchodilator spirometric measurements and the diagnosis of lung cancer was made by mass lesion seen on the chest X-ray, CECT/HRCT thorax. The diagnosis was confirmed by CT or USG guided biopsy or FNAC from the mass lesion.

Lung cancer was found in 9 (9%) cases of COPD. Sekine et al. (2012) concluded that patients with airflow limitations had a significantly higher prevalence of lung cancer than patients without airflow limitations, after adjusting for smoking (Sekine et al., 2012). In our study out of 100 patients of COPD, 9 patients presented with Lung cancer as comorbidity. In the study by Skillrud et al. (1886) out of 113 cases of COPD 9 (7.9%) developed lung cancer (Skillrud et al., 1986) which is very much comparable to our study. Tockman et al. (1987) followed 1031 patients with lung function impairment out of which 27 patients developed lung cancer (Tockman et al., 1987).

The mean age at presentation in the current study was 67.11 years, in a study conducted by Kaur et al. (2017) the mean age at presentation was 58.6 years which is different from our study due to the small sample size in our study (Kaur et al., 2017). De-torres et al. (2015) observed that the mean age at presentation in lung cancer patients with COPD was 61±7 years(de-Torres et al., 2015). Out of 9 patients of lung cancer in our study 6 (66.66%) had previous history of COPD. In the study conducted by Wilson et al. (2008) of 99 patients of lung cancer, 32 (32.32%) had previous history of COPD(Wilson et al., 2008). Similarly, in a study by Wang et

al. (2012) out of 1069 patients of lung cancer 187 (17.49%) had the previous history of COPD (Wang et al., 2012). In a large study on 11888 lung cancer patients Powel et al. (2013) observed that 23% of patients had prior diagnosis of COPD (Powell et al., 2013). The difference in our study is due to a very small sample size.

Smoking is one of the most common predisposing factors for the development of lung cancer, in this study 8(88.89%) out of 9 lungs cancer patients were smokers and only 1 (11.11%) was a non-smoker. In the study by Kaur et al. (2017) majority of the cases; 1000/1301 (76.9%) were smoker (Kaur et al., 2017). Schwartz et al. (2016) states that 24/341 (7%) lung cancer patients were never smoker while 317 (93%) were current or ex-smokers (Schwartz et al., 2016). These studies are comparable with our study. Wang et al. (2012) in a meta-analysis in southern China observed that previous COPD and emphysema in current or ex-smokers were associated with an increased risk of lung cancer (Wang et al., 2012).

Image 1 Chest X ray COPD with lung mass   **Image 2** CT scan of COPD with Lung cancer
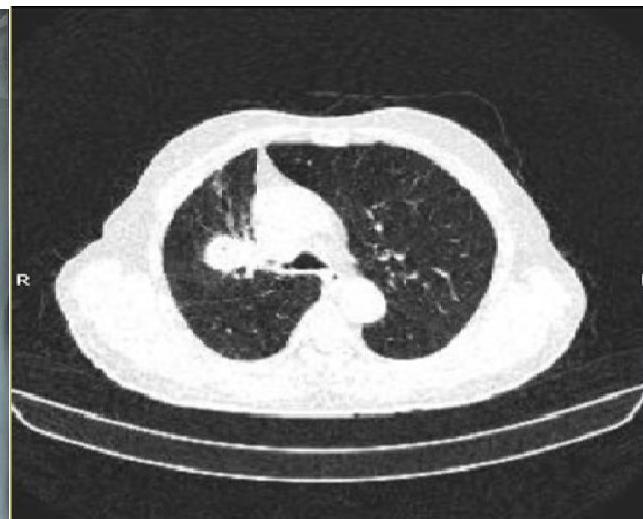
In present study on histopathological or cytopathological examination from the mass lesion of Lung cancer patients, 2 (22.22%) had adenocarcinoma, 6 (66.66%) had squamous cell carcinoma and only 1 (11.11%) patient had small cell carcinoma (image 1 & 2). All patients of lung cancer were in an advanced stage of disease. In a study conducted by Wang et al. (2018) out of 2222 patients of Lung cancer, 724 have COPD. Out of 724 patients of COPD with Lung cancer, 341 (47.1%) had squamous cell carcinoma which was the most common type, 263 (36.3%) had adenocarcinoma, 152 (6.8%) had small cell carcinoma, 78 (3.5%) had large cell carcinoma and 80 (3.3%) patients had other subtype of lung cancer (Wang et al., 2018). In their study de Torres et al. (2011) found that most common type of lung cancer in COPD was squamous cell carcinoma followed by adenocarcinoma and small cell carcinoma (de Torres et al., 2011). Similarly in our study squamous cell carcinoma was the most common type of lung cancer was found.

5. CONCLUSION

In present study we concluded that, COPD and Lung cancer are progressive diseases, who's prevalence increases with advancing age, It showed smoking is the most common etiological factor for the development of COPD as well as Lung cancer. Squamous cell carcinoma is commonly associated with smoking and the previous COPD could increase the risk of Lung cancer in smokers.

Conflicts of Interest:

The authors declare no conflict of interest.

Abbreviations

AFB – Acid Fast Bacilli

AVBRH – Acharya Vinoba Bhave Rural Hospital

CECT – Contrast Enhanced Computerized Tomography

COPD– Chronic Obstructive Pulmonary Disease
DMIMS – Datta Meghe Institution of Medical Sciences
ECG – Electrocardiography
FNAC – Fine Needle Aspiration Cytology
GOLD – Global Initiative for Chronic Obstructive Lung Disease
HRCT – High Resolution Computerized Tomography
USG – Ultrasonography

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